

EXECUTIVE SUMMARY

AIRCRAFT ACCIDENT INVESTIGATION

MQ-9A, T/N 09-4056 EDWARDS AIR FORCE BASE, CALIFORNIA 31 AUGUST 2010

On 31 August 2010, at 1138 local time, an MQ-9A remotely-piloted aircraft, tail number 09-4056, impacted the ground approximately 30 miles south of Edwards Air Force Base, CA, and two miles north of Gray Butte Flight Test Station, Palmdale CA, while participating in a local training mission. The mishap aircraft (MA) was a new production aircraft that had completed acceptance testing and was being temporarily used by Detachment 3 of the Aeronautical Systems Center's (ASC) Medium Altitude Unmanned Aerial Systems Division (ASC/WII). The MA was completely destroyed upon impact, resulting in loss of government property valued at \$10.3M. The mishap caused no personal injury or damage to private property.

Approximately 1 hour and 54 minutes into a regularly scheduled training mission, the mishap pilot (MP) attempted to perform a Slow Flight – High Angle of Attack (AOA) training event (Slow Flight) to demonstrate handling qualities of the MQ-9 at 10 degrees AOA and 18 degrees AOA. The MP's heads-up display showed a calculated stall speed of 69 knots indicated airspeed (KIAS). During the attempted maneuver, the MA's airspeed dropped as low as 61 KIAS and remained below stall speed for 8 seconds. The AOA reached 26 degrees before the left wing stalled. The aircraft rolled left in excess of 30 degrees, nosed over into a downward pitch in excess of 60 degrees, and entered a left-hand spin with yaw in excess of 30 degrees. The MP executed boldface checklist items, and then initiated the emergency procedures for stall recovery and certain procedures for spin recovery. The MA's rate of descent reached in excess of 5,000 feet per minute and the aircraft impacted the ground approximately 21 seconds from the onset of stall. The aircraft control surfaces responded to pilot inputs prior to stall and throughout the attempted recovery. No aircraft or ground control station (GCS) performance problems or anomalies were identified and no maintenance issues or adverse trends were discovered.

The Accident Investigation Board (AIB) president found clear and convincing evidence that the mishap was caused by pilot error. Specifically, the MP's improper control of aircraft airspeed and AOA caused the aircraft to enter a stall and spin. Clear and convincing evidence also shows that the MP's power and pitch settings allowed the MA's airspeed to drop below the indicated stall speed for a period of 8 seconds, and the AOA to reach 26 degrees before the aircraft stalled, entered a spin and crashed. The AIB president found by a preponderance of the evidence that the following factors substantially contributed to the cause of the mishap: (1) MP channelized on AOA and demonstrating the Slow Flight; and (2) a training program that did not adequately prepare the MP for the risks associated with performing Slow Flight at an AOA beyond that which had been an previously demonstrated during flight-test.